1.121 and MPEP 714; and

(C) Starting on a separate page, a marked-up version entitled: "Version with markings to show changes made."

Amendments

In the Specification:

Please substitute the following paragraphs/sections for the pending paragraphs/sections.

- Substitute paragraph 4 with the following paragraph:

Collimated light has been used in an illumination source for a print scanner to reduce the power required. A collimated lens collimates incoming light rays so that collimated light rays exit which travel parallel to one another. Because the rays are made parallel they travel efficiently through a telecentric optical system. FIG. 1A shows an example of a collimated light source lighting technique. A single discrete light source 110 emits light over an area as indicated by example rays 112. The actual emission area depends upon the type of emitter and other factors such as whether a lens, light guide or other optical element is provided to focus or guide the emitted light. A subset 115 of rays 112 are collimated by collimating lens 120 and emerge as parallel rays 125. The subset rays 115 are those rays within an angular range A at the focal point of collimating lens 120 as shown in FIG. 1A.

- Substitute paragraph 8 with the following paragraph:

FIG. 2 shows an example print scanner using a diffuse light source 205 that illuminates prism 130. Diffuse light source 205 includes a discrete emitter array 210 and a diffuser 220. Discrete emitter array 210 is made up of a number of evenly spaced light emitting diodes that emit red light. As shown schematically in FIG. 2, diffuse light source 205 is an inefficient light source for generating an image and passing the image to an image sensor in a telecentric system. Diffuse light travels randomly or in different directions and is not transmitted through an entire telecentric system. For instance, much of the light is blocked by aperture 150. Such inefficiency in illumination of a print scanner is undesirable as it increases the number of emitters needed in array 210 and the power requirements of array 210. This problem is even more acute for telecentric print scanners where flat, uniform illumination is needed across a relatively large platen, such as, a platen big enough to allow capture of images for a roll print or slap print of one or more fingers, or a palm print.

- Substitute paragraph 53 with the following paragraph:

FIG. 3B illustrates how such advantages are achieved in the operation of a hybrid diffuse/collimated illumination system according to the present invention. Illumination source array 310 is placed at a distance equal to or less than the focal length of collimating lens 330. In FIG. 3B, array 310 is shown between a focal point FP of the collimating lens 330 and the lens 330 itself. At least a part (or portion) of the light emitted by illumination source array 310 will pass through diffuser 320 (not shown) and diffuser 325. Each diffuser 320, 325 acts to randomize the light so that rays travel in many different directions. Only

a few rays 311, 312 of the diffuse light are actually shown in FIG. 3B for clarity. Collimating lens 330 receives all or part of the diffuse light rays 312 from diffuser 325. A first portion of the diffuse light indicated by rays 314 is collimated by collimating lens 330 and sent in parallel toward prism 340. This first portion of rays 314 generally corresponds to that portion of rays 312 traveling as if they originated within a cone at focal point FP. The remaining portion of diffuse light indicated by rays 316 that passes through collimating lens 330 falls on the platen as diffuse light. Such diffuse light acts as fill light and allows grey scale shading of a print to be detected by an image sensor.

- Substitute paragraph 54 with the following paragraph:

FIG. 3B further illustrates how a grey scale shaded image of a finger or palm illuminated by rays 314, 316 is obtained. Only one ridge between two valleys is illustrated and enlarged for clarity. The figure is illustrative and is not an actual ray trace drawn to scale. The total illumination (that is, rays 314, 316) incident upon platen 342 arrives from a number of different directions. Ridges act to absorb rays at certain incident angles, while valleys act to reflect rays at certain incident angles. The actual angles at which absorption or reflection occurs depends upon, among other things, the indices of refraction of the ridge, the air at the valley, and the prism and platen. In addition, for some incident angles, diffuse light that falls on the platen surface passes through the platen surface and illuminates a valley. Light reflected from the skin of a ridge at the proper angle, then re-enters the prism and is transmitted to the sensor plane. This light enhances the grey scale range and provides a more desirable image.

- Substitute paragraph 61 with the following paragraph:

FIGS. 4 and 5 illustrate a further embodiment of the present invention. FIG. 4 is a diagram of an illumination system 400 in a print scanner having a light wedge 420. An illumination source array 310 inputs light at an end region 426 of light wedge 420. Light is internally reflected within light wedge 420 and passes to a reflector/diffuser surface 422. Reflector/diffuser surface 422 is one angled face or surface of light wedge 420. Preferably, surface 422 is provided at an angle with respect to the optical axis along which light is emitted by illumination source 310. In one embodiment, reflector/diffuse surface 422 acts to both reflect light and make the reflected light more diffuse. As shown in FIG. 5, light rays 500 emitted by illumination source 310 pass through light wedge 420 to impinge on reflector/diffuser surface 422. Diffuse, reflected rays 510 then pass from surface 422 out through the surface 424 of light wedge 420. For clarity, other ray paths illustrating the internal reflection of light within light wedge 420 are omitted. This internal reflection within light wedge 420 provides a further advantage, however, as it tends to make the light even more diffuse and improve grey scale shading.

- Substitute paragraph 62 with the following paragraph:

As shown in FIG. 4, light passing from surface 424 or light wedge 420 then passes to diffuser 430. Diffuser 430 makes the light even more diffuse so that uniform illumination is provided to platen 342. When a finger is placed on platen 342 as shown in FIG. 4, an image of the finger is then sent through optical system 440 to camera system 450 for